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presents

Canny SLIC to Compute Content-Sensitive Superpixels

by

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Computer vision is concerned with the automatic extraction, analysis and understanding of useful information from a single image or sequence of images. It involves the development of a theoretical and algorithmic basis to achieve automatic visual understanding. As an initial step in computer vision, image segmentation methods are essential. Image segmentation is the operation of partitioning an image into a collection of connected sets of pixels. In particular, object segmentation, which involves the partitioning of an image into semantically meaningful regions, has been an important challenge for researchers in computer vision applications, e.g., object recognition, image search and retrieval, medical image segmentation, image editing, etc. Superpixel segmentation is becoming a ubiquitous initial preprocessing step in object segmentation. It is important that the resulting superpixels preserve image boundaries. The simple linear iterative clustering (SLIC) algorithm is a popular method for superpixel segmentation. However, in the case of content-sensitive superpixels, which are located in small structure-dense regions with high color variation, SLIC may not generate boundary-preserving superpixels. Some methods have alleviated this problem by, e.g., using complex distance measures. However, as
an initial preprocessing step, the simplicity of superpixel segmentation is crucial. We propose a relatively simple method that uses the Canny edge detector in combination with SLIC to obtain a relatively simple and computationally efficient superpixel segmentation algorithm that generates superpixels with good image boundary adherence.